Handbook for Postgraduate Students

2006 – 2007

Institute for Astronomy
Department of Physics and Astronomy
University of Edinburgh
Blackford Hill
Edinburgh
EH9 3HJ

Foreword

The purpose of this *Handbook* is to give new postgraduate students information to facilitate their settling in at the Observatory and to provide all postgraduate students with a digest of information and statements of Institute, University and PPARC policy which will be of use throughout the course of their PhD studies.

This *Handbook* is aimed very much at the postgraduate students in the Institute and so is informal in tone and content, but it is also an official document, in the sense of containing statements of Institute policy. On arrival you may find life somewhat confusing while you find your feet. Don't be afraid to ask questions of anyone – it will speed your settling in at the Observatory. The factual information contained herein is updated every year.

History

Written by Robert Mann (1992), revised by:

- Hugh Jones — 1993
- Jonathan Tedds — 1994
- Henry Buckley and Alan Heavens — 1995
- Richard Brockie — 1996
- Richard Knox — 1997
- Jo McAllister — 1998
- Simon Glover — 1999
- James Manners — 2000
- Michael Brown — 2001
- Olivia Johnson — 2002
- Ben Panter — 2003
- Emma Taylor — 2004
- Thomas Targett — 2005
- Barnaby Rowe — 2006

Contents

1 Introduction

The Institute for Astronomy (IfA) is situated within the Royal Observatory on Blackford Hill, about two miles to the south of the city centre and about half a mile away from King's Buildings (KB), which is the main University science area.

The Royal Observatory Edinburgh (ROE) is an umbrella term embracing both the Institute (which is part of Edinburgh University's School of Physics) and the UK Astronomy Technology Centre (ATC), which is an establishment funded directly by PPARC. The role of the ATC is technical support for British telescopes in Chile, Hawaii, La Palma and Australia, as well as development of front-line instrumentation for both ground and space-based telescopes. Both the IfA and the ATC are now members of the Scottish Universities Physics Alliance (SUPA; see www.supa.ac.uk on the web).

The ROE also houses the UK Schmidt Telescope Unit (UKSTU) with its library of photographic plates covering the southern sky and the SUPERCOSMOS plate-measuring machine. This used to be funded directly by PPARC but is now merged with the IfA as the Wide Field Astronomy group. The Observatory also houses members of staff working on the UK section of the international Astronomical Virtual Observatory (AVO) project. The staff and research facilities of the ATC provide valuable resources to complement those of the Institute and the students are made to feel very much part of the Observatory, with all the benefits that follow from that.

One disadvantage of the geographical location on Blackford Hill (apart from climbing up in mid-winter) is that there is little contact with other schools in the University. This situation is slowly changing as a result of the inclusion of the institute as a member of the School of Physics, which is located down the hill in the James Clerk Maxwell Building (JCMB) at the KB campus. The old Physics department is now called the School of Physics and the independent status of the former Department of Astronomy is preserved through its establishment as an Astronomical Institute within the merged school. This merger is aimed to result in closer ties with the research groups in Physics, being profitable to postgraduate students in widening the range of available research seminars. The School of Physics also encompases the ESPCC and NeSC.

The School also organises an annual trip to Firbush Outdoor Centre, the University's outdoor centre on Loch Tay. This trip is heavily subsidised by the department and allows astronomers a chance to meet some of the other members of the department in an informal setting. You get the chance to learn any number of new outdoors skills or just relax with a beer!

2 Arrival

New PhD students will arrive on the 11th September (or as otherwise arranged with their supervisors) when they will find themselves with a terminal in one of the two terminal rooms (C23 & C25) and two supervisors yearning to impart to them vast quantities of knowledge of things arcane and astronomical. There is also a large amount of administrative work that must be done, the two most important pieces of which are Matriculation and Getting Paid.

2.1 Getting Paid

PPARC funded students are paid quarterly by PPARC via BACS. Details of this, and of any action necessary on your part should have been sent to you - if you do have any queries ask Liz Gibson.

2.2 Matriculation

Postgraduate students are required to matriculate at the start of their period of study and the start of each subsequent academic year until they submit their theses. Matriculation is performed by the staff of the University Registry and takes place at Adam House, 5 Chambers Street.

Enrolment for the 2006-2007 session will be as follows:

All postgraduate students are *strongly* advised to matriculate at Adam House on Tuesday 12 September, between 0915-1630. If this is not possible sessions applicable to IfA students will also be running 1230-1630 Monday 11 September, 0915-1230 Wednesday 13 September and 1230-1630 Friday 15 September.

Outside the above dates, postgraduates may also register in the University Registry, Old College, South Bridge, Mondays to Fridays between 0930 and 1630. Due to staff training, the Registry opens at 10am on Wednesdays.

Prior to matriculating, you need to pick up your matriculation forms from the Faculty office at KB - details of this should have been sent to you. You will need to take these along to Adam House when you matriculate. If no registration pack has been sent to you by 1 September 2006 then you should contact the Student Administration Services within the Registry on 0131 650 2845. For your matriculation you should also take along the following documents:

1. Letter of admission from the Faculty of Science,
2. Evidence that fees will be paid direct to the University by a public body (*eg.* letter from PPARC notifying unconditional award of studentship),
3. Formal proof of identity (eg. passport or birth certificate)

All matriculated students are required to have a University Card as proof of identity. Again, details should already have been sent to you.

Students requiring further information (*e.g.* non-PPARC students with more complicated fee-paying arrangements or those requiring enrolment by post, due to absence from Edinburgh during October) should contact the Postgraduate Section at The Registry, Old College. The office hours for the Registry are 0930-1230 (except on Wednesdays, when they open at 1000) and 1330-1630 (during term-time only).

All of the information here, and other important notes on the matriculation procedure (including fees payment) can be found at: http://www.registry.ed.ac.uk/student/matriculation.htm

NB. the arrangements for continuing postgraduates are slightly different - see the registry webpages for details.

2.3 Talks to new students

Several introductory talks will be given to new students shortly after their arrival. These will be given by the Postgraduate Course Organiser (currently John Peacock), the Starlink site manager (John Barrow) who administers the computer system, a member of the library staff and a member of staff from the UKATC.

In addition, the new students are invited to a series of talks by existing PhD students, which should be organised soon after their arrival. Each student in turn gives a short, informal outline of his or her research project, so that the new students can get to know which other students are working in areas related to their own, as well as gaining a more general view of the research being undertaken in the department.

3 Facilities

3.1 Computing

The computer system is one of the hardest things for new students to get used to, but do so they must, as much of the work of a modern astronomer is computer-based.

Starlink

Although now defunct and replaced by another as yet unnamed organization, a large amount of astronomy hardware and software was managed by Starlink. Although nolonger factually correct, the new system operates esentially as described below.

The Observatory hosts one of the nodes of the Starlink computer network, which is run by PPARC and which links the principal astronomical institutes in the UK. Much of the computer hardware in the Observatory belongs to Starlink, some to the ATC, and an increasing amount to the IfA but it is all available for use by students. The basis of the Starlink node is a cluster of PCs running LINUX and DEC/Compaq/HP/Whoever-owns-them-this-week Alphas. All the machines have Unix based operating systems, although there are some differences between the Alpha and LINUX command languages, such as the compiling commands.

In addition to providing hardware, Starlink also supplies and supports software, such as subroutine libraries, graphics and data reduction packages.

A Starlink Local Users Group (SLUG) meets every six months. This is a formal forum for the discussion of problems relating to the use of the Edinburgh Starlink node and its future development, in the presence of a representative from Starlink. On the same day as the SLUG there is a meeting of the Local Management Committee (LMC), which discusses points raised by users at the SLUG and draws up a formal "wish list" of desired hardware. Your student representative on this committee is currently Stuart Lynn.

User-names and accounts on the computer are obtainable from the system manager of the Starlink node, John Barrow, after his introductory talk which he will deliver shortly after you arrive.

Default Setup

There has recently been a complete overhaul to the default setups given to new users. They should now work and look similar on both Linux and Alpha machines. Some things you might like to do when you first get here to get yourself accustomed to the computers is to change things such as your colour scheme. See Unix User Note 9.2 (intra.roe.ac.uk/atc/computing/docs/uun/uun009.html).

Computing Helpdesk

The computing support at the ROE is organised via the **Helpdesk** system. Any questions, fault-reports, pleas for help etc. should be submitted as a Helpdesk ticket by logging on (using your ROE username) at the following Web Site:

http://helpdesk.roe.ac.uk/helpdesk/index.htm

It is important that you use this ticketing system for your computing problems, as it is designed to improve the efficiency of site-wide computing support through intelligent allocation of ticketed tasks. The ROE Helpdesk can also be used for any site maintenance requests (e.g. fixing dripping taps, broken windows etc.).

Disk space

All users are given a certain amount of file-space on a common user disk and they cannot exceed this quota. In addition, there are "Scratch Disks", which are designed for temporary storage of data under reduction. In practice, this space will become your regular working directory. If you

need some "Scratch" space, or desperately need your home space increasing, you should use the Helpdesk System described above to get in touch with the computing support staff (most likely John Barrow or Horst Meyerdierks will then help you).

Backups: Exabytes, DATs, Magnetic Tapes, DVDs and RAID

The computer system crashes from time to time, which can result in the loss of files. So, to prevent the loss of valuable information, it is highly advisable to make regular "back–ups" – *i.e.* to copy files onto some external storage medium.

In recent years many students used one of either Exabyte – high-quality 8mm video cartridges – DAT, or magnetic tape. Exabytes and DATs hold an immense amount of information, the biggest ones can hold up to 20GB. They are available on request from Stuart Lynn or from the stationary cupboard. Far cheaper are CD-R or CD-RW disks, which can be written from most of the newer LINUX boxes in the department.

There is also a DVD rewriter available for use by postgrads. This is installed on *fiag* in C25 and blank disks can be obtained from Stuart Lynn. These disks have far greater capacity than ordinary CDs (4.7Gb compared to 650Mb) and so are more suitable for backing up moderate amounts of data.

However, although these manual forms of backup are still advisable, most backups will now be best managed by a RAID-array backup server. This is a system in which users can clone their scratch space automatically every night. This provides you with a copy of you work never less than 24 hours old, and should solve many disk-failure issues. If you want to use this system (RECOMMENDED) then please submit a Helpdesk ticket asking to be given permission to write to the disk. After this, although unofficially, Eric Titley has setup a web-page with instructions on how to setup the regular backup system and asign a time for these backups to occur so as not to clogup the network.

USB Memory Stick

It is often necessary to transfer data from one machine to another (for instance, Powerpoint presentations), without having the hassle of burning a CD or networking both machines. For this there are now two 128Mb USB memory sticks, which have been installed on *lyon* in C23 and *fiag* in C25.

Email

The Starlink network enables the sending of electronic mail (email) messages between users on the same node, at different nodes and, through its connections to other international computer networks, to research institutions throughout the world. Email is a very convenient means of communication, both within the Observatory and to colleagues elsewhere. To access your email account, type "pine" or "pine-sarge" (on one of the newer Linux systems). Your address at the observatory will be login@roe.ac.uk. You also automatically have a university email address and must organise to get university mail forwarded to your roe account.

Postgraduate Laptops

There are currently four new Laptops available for postgraduate use. These are equipped with dual boot Linux/Windows operating systems and can be connected to the local ROE ethernet with adequate notice. To arrange to use one of the laptops we now have a standardized system with the ATC, namely the use of the Helpdesk system. A submitted helpdesk ticket will then supply Jonathan Dearden with the dates the laptops is required and which specific pieces of software are needed. For further information, contact the computer rep., Stuart Lynn.

Computer Training

The Site Manager, John Barrow will give a short talk on Starlink and the Observatory's computing facilities within the first few weeks of the October term. The Library has some books on how to

program in FORTRAN, C and IDL which are the most common languages used. Often the most efficient way of solving computing difficulties is to ask for help from other students. For hardware problems it is best to submit a Helpdesk ticket – probably one of either Horst Meyerdierks or John Barrow will then be in touch to help you. The University also runs good programming courses for beginners - these are available through the Transferable Skills program (see later).

Computing Webpages

A large amount of information on all aspects of computing provision at ROE is available on the Web - see http://intra.roe.ac.uk/atc/computing/ and links therefrom. Particularly useful are the online User Notes, to be found by following the Documents link. A form for the ROE Helpdesk can also be found on this site for reporting any problems.

3.2 The Library

The Royal Observatory has a very substantial working library of astronomical books and periodicals and, in the Crawford Collection, arguably the world's finest collection of rare and historical books on astronomy and related topics. Most of the books, excepting those in the Crawford Collection, may be borrowed from the Library, subject to the requirement that they should be on site within office hours – *ie.* they may only be taken home overnight or over the weekend – although some books, and all periodicals, are for reference within the Library only. An Inter–Library Loan scheme operates through which one may borrow books from other libraries or obtain photocopies of articles from journals not to be found in the Library's own collection.

One of the library staff will give new research students a tour of the library, including the Crawford Collection, as well as an introduction to the indexing and borrowing systems used.

Photocopying of library material may be done, subject to copyright restrictions, using the photocopier in the Library. Other photocopiers are to be found in the Management Building, in the West Wing and next to the entrance to the Plate Library. **Overhead projector slides must not be used in the Library photocopier** but can be used in other photocopiers on site with care.

3.3 The Lodge and Security

The Lodge contains the Observatory's reception area, as well as pigeonholes for all staff and students. Mail may be franked and sent from the Lodge, but personal letters must be paid for. The Lodge is also one of the points on the internal University mail system, which connects departments and University offices throughout the city, with collections at 9am and 2.30pm each working day.

All visitors to the Observatory, except those going to the Visitor Centre, must be signed in at the Lodge. You can access most areas of the site using a card which will be issued to you when you arrive and must be returned when you finish your PhD. When the glass doors to the 1967 building are locked you must use the library doors to enter and exit the IfA.

Liz Gibson is currently responsible for Health and Safety within the Institute offices. Liz Gibson, Peter Brand, James Dunlop and Nathalie Dupin are First–aiders.

3.4 The Common Room

The ROE Common Room houses a subsidised canteen, which operates at both coffee time (11.00am) and lunch time (12.30pm - 1.45pm) – the cost of a two-course lunch being about £3.00. In addition, there is a student–run coffee club for afternoon tea (4.15pm). It is tradition for the 1st year postgrads to run this!

The Common Room is also the venue for informal coffee-time talks and formal seminars and has a continually-updated rack of preprints of papers from research institutes throughout the world.

A microwave is situated in the coffee club cupboard adjoining the canteen for use outside canteen hours.

3.5 Alternative Culinary Facilities

A kettle, microwave and fridge are available in the small kitchen near C23 and C25.

3.6 Visitor Centre

The ROE Visitor Centre has a permanent exhibition open to school visits only throughout the year and also organises special events, such as Open Evenings, a series of lectures over the winter months, evening visits from organised groups and "Popular Observing", which opens the remaining working telescopes in the Observatory to public use over the winter. The Visitor Centre has a permanent staff, but students are employed to run the "Popular Observing" and to address groups of visitors in the evenings. Students are strongly encouraged by the Institute to help the Visitor Centre with groups. The benefit acts in two ways: talking in public is something all research scientists have to do, and this is good experience; secondly, society funds astronomy, so we have some obligation to give something in return. Giving the public the chance to hear from and talk to active researchers is a good way to do this, and to further the public understanding of science.

3.7 Stationery

A supply of stationery for use by University staff and students is available from the stationary cupboard. As responsible graduate students, you are free to remove the key from its hook in Liz's office at any time. If you find certain supplies are running low, a sheet in the stationery cupboard is provided to note down items to order (please write clearly and remember to leave your name). For any other details regarding stationary ask Nathalie Dupin.

3.8 Faxing and Telephoning

Liz Gibson has a fax machine for official use. When telephoning outside the Observatory, the number to be dialled must be prefixed by a "9" to get an outside line. Almost all the telephones in the Observatory are set not to call outside Edinburgh between Friday evening and Monday morning, although they can make international calls during the week. Calls made are logged and all personal calls, except reasonable, necessary local ones should be paid for. The fax number is 0131-668-8416.

3.9 Office Accommodation

The office accommodation available to the Institute is determined through negotiation with the ATC. At present, student accommodation is distributed between the following areas: C23, C25, R8 (in the research corridor of the 1894 Building) and the offices in the Vista Huts (near the westerly canteen entrance). The plan is for R8 to be phased out of use as a postgraduate office over the 2006/2007 winter break.

4 During your PhD

This section covers much of what happens through the 3 years of a PhD, describing the various parts of the training that a research student receives during that time, both formally and – often more successfully – informally, through being in a research institute like the Observatory. Communication skills are an important part of the scientist's armoury and these skills, enabling one to present a coherent and convincing argument, either in writing or orally, are amongst those which must be developed during postgraduate research.

4.1 Talks

There are many opportunities to give talks, as well as to hear them, which are often as valuable for illustrating how, or how not, to give a talk as for the scientific content of the talk itself.

Coffee–time talks: Informal talks are given in the Common Room at coffee–time, starting at 11.00am. These last for twenty to thirty minutes. The idea of these talks is for researchers to give brief, informal summaries of their own current work or other interesting new work in their field, explained at a level suitable for a non–specialist audience. Often these talks can explain an idea or present news of an interesting observation that people have heard circulating informally, but about which they have not been able to learn sufficient information. These are presently organised by Will Percival.

ROE Seminars: The Observatory also runs a weekly series of more formal, hour–long research seminars, which are held in the Common Room usually on wednesday afternoons at 4pm. These are given by invited speakers and their aim is to provide a more detailed survey of current astronomical research. PhD students are expected to attend all seminars, as they form part of the taught component of the PhD course. The present organiser is David Bacon.

Pedagogical Seminars: During your second year you will be expected to give a 'pedagogical seminar'. The format of these talks is similar to an undergraduate lecture and is aimed at teaching the attendees about an astronomical topic of your choice. It should be aimed at a final year undergraduate level and last approximately one hour.

Robert Cormack Bequest Meeting: In 1942, the Royal Society of Edinburgh (RSE) was made the residuary legatee of the estate of Robert Cormack, a local businessman, the society being "directed to administer this bequest for the purpose of promoting astronomical knowledge and research in Scotland". Under the terms of the bequest, the society makes a number of research fellowships and grants, as well as holding an annual meeting each April. Every other year the meeting is held in Edinburgh, in the Society's rooms on George Street. In the intervening years it is held outside Edinburgh. In this event the Institute will pay travel expenses. Members of the astronomy groups at Edinburgh, Glasgow and St. Andrews Universities are invited to this meeting, to give talks on their work, listen to other such talks and have a very good tea afterwards, before a lecture to the members of the society by an astronomer of note. There are also a number of papers presented as posters. In practice, each Edinburgh student will give one poster presentation during their time here, while some will also give talks.

PIPC Seminars: The Physics Intergroup Postgraduate Committee (PIPC) aims to promote interaction between the different research groups in the Department of Physics and Astronomy. One of the ways in which it does this is by organising regular seminars at 1pm on Thursdays to give postgrads a chance to talk about their work in front of a (friendly) audience of other postgrads. They are always keen to solicit more talks from astronomers, and provide a good way to get to know people in the rest of the Department. We have one committee place reserved for an astronomer, this is currently Jenny Richardson. For more details, see the PIPC webpages:

http://www.ph.ed.ac.uk/internal/pgseminar/.

4.2 Teaching Opportunities

Throughout their Ph.D., research students have the opportunity to do paid demonstrating work in undergraduate labs at the Observatory. In addition, the expansion of the first year undergraduate course and increase in student numbers generally means that there is also the opportunity to teach in undergraduate tutorials, supervise computer labs and help supervise undergraduate experiments with the University telescope. Your Postgraduate Coordination Representative, Eduardo Ibar, will be looking for Tutors to teach first year undergraduate tutorials in the new academic year; don't hesitate to be in touch if you're interested or have questions.

The integration with Physics also gives students the opportunity to demonstrate in the undergraduate Physics labs. Details are distributed at the start of each academic year. If you are interested in teaching Physics courses "down-the-hill" then contact the Physics Postgraduate Secretary, Jane Patterson at Jane.Patterson@ed.ac.uk.

Regardless of whether you take tutorials or demonstrate in labs, it is necessary that you attend a one-day course run for postgraduates who will be involved in teaching – Liz Gibson can arrange this for you.

As of 2005 postgraduate students are also required to fill in a Disclosure Scotland form to be veted for the position of childcare lecturing. The appropriate form will be posted to you before you begin your course.

4.3 1st year Reading Group

A few years ago the Kamikaze Seminars (in which the speaker to be heckled about a given topic was pulled at random from the audience) were replaced by the kinder, gentler reading group. Attended by first year students during the first semester at Edinburgh, the group is led by one or more members of staff and meets twice a week to discuss textbook readings. The aim is to give students a crash course resulting in a working knowledge of many of the most important astrophysical concepts. While the galvanizing threat of public humiliation attendant to the Kamikazes is lost in the new system, students are still expected to participate actively in these discussions. Information on the reading group can be found on John Peacock's webpage at http://www.roe.ac.uk/∼jap/reading.html.

4.4 Undergraduate Lectures

A number of the lecture courses on offer to third and fourth year undergraduate astrophysics students can be of interest to research students as well, particularly to first years. Andy Taylor's lectures on Statistics and (later in the year) Cosmology, and Alan Heavens' General Relativity course are good examples. Information on timetables can be obtained from Liz Gibson.

In addition, some postgraduate students may be interested in lectures – either undergraduate or postgraduate – given in the physics department, *e.g.* on particle physics or mathematical physics. The School of Physics' central web-page gives timetable information, and can be accessed from the IfA home page.

4.5 First Year Report and Interview

A written report is required from each student. This exercise can serve as a valuable introduction to writing text in the style format of a thesis chapter. The first-year report should contain the following elements: (a) Introduction and background bibliography; (b) Work carried out; (c) Outline plans for years 2 & 3. In some areas of research, it is understood that (a) will dominate. The report should attain a target length of perhaps 20-30 pages, with an absolute minimum of 12-15 pages. This report will be followed by an interview with staff members from the IfA to discuss the report itself and any other issues the student has with their studies: the interview can expected to be scientifically rigorous, but will provide much helpful feedback.

Many students find that writing the report helps them to sort out in their own minds the way that their PhD studies will progress, while the background reading necessary for it provides a fuller comprehension of the scientific motivation for the project, as well as stimulating ideas as to how it could be developed and extended, while the interview gives a gentle foretaste of what a PhD *viva* is like.

4.6 Second Year Interviews

For years 2 & 3, the report should consist of a shorter outline of a few pages, concentrating on the expected timeline for the thesis.

There will also be a chance to talk with John Peacock and a Research Fellow about careers in astronomy and the application process which usually begins in September & October.

4.7 Second Year Posters

At the end of their second year, students write a poster for the Physics and Astronomy notice board. A poster session is held as part of the formal welcome to new students into the Department which is held in late October. Posters should be A0 in size and can be printed at the observatory by Jason Cowan. The material should be presented at a level comprehensible to an honours graduate in Physics. Posters will contain an abstract of less that 100 words, in total there will be less than 1000 words including references and captions. Bullet points, rather than large sections of uninterrupted text should be used as this encourages discussion.

4.8 Mentoring Meetings

These are meetings between the student and the two members of staff (normally John Peacock and James Dunlop) about halfway through the year. Their aim is to check on the general progress of the student's PhD. It is also an opportunity for the student to raise any issues they may be concerned about in an informal environment without the presence of their direct project supervisor. These meetings only covered years 1 and 2 in 2005 but have now been extended to all.

4.9 Transferable Skills

For the past couple of years, the Faculty of Science and Engineering has been developing a major new programme of transferable skills training for postgraduates, reflecting the growing importance of these skills both for successful completion of a PhD and for future career prospects. Courses include such things as Effective Presentations, Scientific Paper Production, Tutoring and Demonstrating, Team Development etc. as well as a number of computing courses. These courses take place

throughout the year, and are advertised well in advance, but details can also be found on the Web at: http://www.scieng.ed.ac.uk/transkill.htm.

4.10 Student Representation

As of Autumn 2006 the traditional role of the Postgraduate Student Representative has been split in two. Two people, chosen annually from the ranks of the Institute's PhD students, will take on the roles of Postgraduate Representative and Postgraduate Coordination Representative. Those holding these positions position have a variety of roles to play, both within the Institute and acting as a representative in dealings with external bodies, such as the Student Union or the Faculty.

The latter role is by far the less important in practice, since, as this is a small institute, it is possible and, indeed, very desirable, for problems to be sorted out informally and internally, without recourse to external agencies. There may, of course, be situations where this is necessary and in such cases the Postgraduate Rep. should make representations to the appropriate authorities. However, the Representatives' real jobs lie within the Institute, acting as an intermediary, where necessary, between staff and students.

The Postgrad. Rep. is invited to the quarterly Institute staff meetings, where s/he is party to discussions on all issues relating to the running of the Institute, except those confidential matters concerning individual students or those issues (*e.g.* some financial matters) where the students have no legitimate interest. The Postgrad. Rep. may represent the views of the students either by raising issues of concern or interest through items on the agenda of the meetings or by simply being there to make a contribution on the students' behalf when topics are under discussion. This arrangement has proven to be very useful during the period since its introduction.

The Postgrad. Rep. is also responsible for organising the annual "Gripe Meetings" held each September, at which the students may put any whinges to the Head of Institute directly, and for the preparation of this *Handbook*. The Postgraduate Representative for this year is Michael Briggs.

The Postgraduate Coordination Representative has a slightly more "hands-on" role, being responsible for organising the postgraduate response to requests from IfA staff needing students for, as typical examples: tutors, tour guides, paid volunteers etc. The Postgraduate Coordination Representative this year is Eduardo Ibar.

4.11 Postgraduate Course Organiser

The Postgraduate Course Organiser has overall responsibility for the running of the PhD programme. Currently the Postgraduate Course Organiser is John Peacock.

4.12 Relationship between student and supervisors

All students in the Institute have two supervisors, occasionally including one from the ATC staff. In many cases the student works almost exclusively with one of them, on the day–to–day level, while the other supervisor keeps a watching brief, following the progress made by the student.

The nature and quality of the relationships between students and supervisors are very much determined by the individuals involved, rather than anything inherent in the situation, and it is for each student and pair of supervisors to develop a way of working together that they find mutually satisfactory. Both the University and PPARC distribute booklets on good supervisor–student practice.

In the great majority of cases this proves to be possible and an amicable and profitable relationship

develops, but in a very few cases it does not and so it is desirable for there to be procedures in place to handle such situations when they arise and, hopefully, to nip them in the bud before there is any danger of their becoming too serious.

Depending on the circumstances, PhD students with any sort of problem can speak to the Postgraduate Advisor, Postgraduate Course Organiser (John Peacock), The Postgraduate Rep. or the Head of Institute (Jim Dunlop), all of whom will be happy to listen and act as an intermediary if required.

Procedures like those outlined below should not, of course, take the place of the informal interaction between student and supervisor, but should complement it and, where necessary, be useful where such interaction is problematic.

"First" and "Second" Supervisors: The different aspects of responsibility for the student's progress should be divided explicitly between the two supervisors: the "First" Supervisor has responsibility for the day–to–day, 'tactical' side, while the "Second" Supervisor has the overview, the 'strategic' side. In the case where the two supervisors have equal prominence on the day–to–day side, then the University supervisor should be the "Second" Supervisor. The "Second" Supervisor should keep a close eye on the progress of the student's research, although s/he may play no active part in it.

Biannual meetings: Twice a year – in early October and early April, subject to mutual convenience – there should be meetings to discuss the student's progress in the previous six months and to outline goals for the next six months. These meetings should be between: *i*) the two supervisors; *ii*) the "Second" Supervisor and the student; *iii*) all three together.

These meetings should be largely unnecessary in the vast majority of cases, where there are no great problems, although they may be useful in allowing a discussion of longer term goals than is often possible when day–to–day matters intervene.

4.13 Over-running

One purpose of the PhD course is to demonstrate the student's ability to complete a project in a given time. PPARC and the University set upper limits for this. PPARC funding lasts for only three years, and they set a time limit for submission of four years. If this latter limit is exceeded, the Institute may be penalized by a reduction in studentships, making it harder in future for students who want to do research here. Consequently, the University also sets a limit of four years - candidates exceeding this limit have to pay a continuation fee, currently £400 per annum.

The Institute expects that theses will be submitted as soon as possible after the minimum period, and should certainly be submitted within three years and three months after starting. Students who over-run this limit may have their username removed from the ROE computer system unless a good case can be made on their behalf.

4.14 Publishing

Papers are generally submitted for publication in *Monthly Notices of the Royal Astronomical Society*, although another journal might be more appropriate in a particular situation. All journals give instructions to authors about the correct style to be used and the procedure for submitting papers. The main astronomical journals are currently developing a common style, as well as preparing for the submission of papers in TEXor LATEXformats via email, so the instructions to authors are under revision and it is advisable to consult the most recent number of the appropriate journal before submitting a paper.

In addition to paper, preprints are published electronically. The preprint library allows a wider audience to view new papers. This can be found on the Web at

http://uk.arxiv.org

and includes instructions for submitting preprints electronically.

4.15 Thesis Submission

About **two months** before the intended submission date, the student should complete and return a "Notice of Intention" form and an "Access to a Thesis" form to the Postgraduate Office of the Faculty of Science, King's Buildings. These forms require the **exact** title of the thesis, so it is advisable for this to be approved by the student's supervisors before they are submitted.

The "Notice of Intention" form draws the candidate's attention to a number of University regulations governing the content and originality of theses, which must be closely adhered to, as must those concerning format and binding of theses. There are a number of bookbinders in Edinburgh who can prepare a thesis to the University standards: one that a number of students have found satisfactory is J. Christie (0131-556-4073).

Two bound copies of the thesis, each containing an abstract, should be submitted to the Faculty Office, as well as three additional copies of the abstract, typed on the appropriate form.

5 Going Observing and Attending Conferences

Being an astronomer involves a lot of travel, whether to telescopes, visiting collaborators or attending conferences. However it can be a major headache if not thought about enough time in advance.

5.1 Applying for Telescope Time

The allocation of time on telescopes in which the UK has share, (such as the Anglo-Australian Telescope, the William Herschel Telescope, the Isaac Newton Telescope, the Jacobus Kaptyen Telescope, James Clerk Maxwell Telescope and the United Kingdom Infrared Telescope), is decided by a system of peer review, through the Panel for the Allocation of Telescope Time (PATT).

The year is split up into two semesters (February - July and August - January) and the semester chosen depends on the objects to be observed. The applicant fills in a standard PATT form, which requests information about the objects to be observed and the instruments required for the observation, as well as requiring a scientific justification for the proposed project. On the basis of the scientific case and the technical feasibility of the project the PATT panel selects which projects should be allocated telescope time. All telescopes are heavily over-subscribed, so that only the highest-rated proposals are awarded time. The deadlines for receipt of proposals are in the spring and autumn.

The procedure outlined above covers observational projects that require one night or more of telescope time. Projects requiring no more than a few hours may be performed in "Service Time" by staff astronomers, rather than the scientists who proposed the project. Service observations are also subject to peer review to decide which should be undertaken.

Collaboration with astronomers from other countries can enable one to have access to telescopes in which the UK has no financial share. Other facilities *eg.* HST and other satellites, the VLA, Merlin etc., also make their time available to UK astronomers. These have different applications

procedures and deadlines from those administered by PATT, but also decide telescope allocation through peer review.

Your supervisor will advise you with regards which telescopes to apply to and when these need to be submitted.

5.2 Conference and Summer Schools

Conferences provide an opportunity to learn of the very latest research being done in one's field, and to meet and question the people doing it, as well as to discuss one's own work and set up possible collaborations, while the more pedagogical atmosphere of summer schools can enable one to improve one's knowledge and understanding of the fundamentals of one's field.

Posters advertising forthcoming conferences and summer schools are displayed throughout the Observatory, although word–of–mouth, especially from one's supervisors is often the best way to hear about them. As with most things these days, there is also a reasonably complete list on the Web, at http://cadcwww.dao.nrc.ca/meetings/. Conference and job information is available in the university corridor and library.

Financial support for attending such meetings can be obtained from a number of sources. The organisers usually have some funding to offer themselves, but the amount is sometimes limited and given on a 'first come, first served' basis, so early applications are essential. PPARC may support attendance of summer schools under their "Fieldwork Expenses" budget. Students may use this source of funding more than once, but must make sure that it is clear under what budget this funding is sought, so that there is no danger of the one conference funding being blown accidentally on a summer school. The funding for summer schools is discretionary, but is not likely to exceed half of the total cost. The Institute is also able to support attendance at meetings, subject to budgetary constraints.

The National Astronomy Meeting (NAM) has become an annual event in the UK. This takes place around Easter each year. The Institute encourages students to attend, and where possible costs will be covered by the Institute.

5.3 Financing Travel

Travel to foreign parts is expensive. Before you travel, you must get approval from your supervisor and from whichever body you hope will fund you. To do this you must estimate how much your travel costs will be.

For overseas trips, travel may be booked through BTI, Gray Dawes or Ian Dickson. The IfA has an account with BTI and Gray Dawes, so flight costs will be paid directly. Ian Dickson will issue an invoice. An alternative is to book through some other agent, and then claim the money back from the IfA - this may not be practical for the majority of students, but quite often works out cheaper. Of course, it is vital that you ensure that your trip has been approved and funded before you spend any of your own money. Enquiries to BTI can be made by phone, fax or email

BTI Tel. 0870 241 4770, email - edinburgh.university@btiuk.co.uk

Liz has fax numbers and alternative telephone numbers.

Observing trips may be funded by PPARC. To organise this you must fill out a PPARC form, again available from Liz Gibson. In this form you state the destination and numbers of nights away at both hotels and telescope accommodation. Ensure that you ask for the maximum possible number of nights you might need, as the sum they award you is calculated from their opinion of how much it costs to get to a certain destination and a fixed amount for each day spent there. You will not

be able to renegotiate your claim when you suddenly realise that, for example, you need to spend an extra two days in Hawaii reducing your data before returning.

Your supervisor will then detail the case for PPARC funding your trip on the form, and you get it signed by your University (**not** ATC) Supervisor. Keep a copy for yourself, give another to Liz Gibson and make sure that the form gets to PPARC **at least one month before the proposed journey**.

PPARC will write back having approved your trip giving details of their funding. They tend to take quite a while to do this, so if you desperately need to know whether you have approval or not and for how much because the travel agents are only going to hold your tickets for you for a week, ring them up and pester them. PPARC usually manage to decide very quickly once they have been pestered. Enclosed will be a claim form for you to use once you return.

Most students are not in a position to finance their trip and then claim the expenses back from PPARC. Students in exceptional circumstances can apply to the University for an interest–free loan which must be paid back as soon as possible after the trip. Requests for such loans must be made allowing at least **10 working days** for the loan to be issued (ideally allow a bit longer just in case!). The request should be supported by the P102 and the letter of approval from PPARC. Loan request forms should be signed by the University Supervisor and are available from Liz Gibson. Students may not be in receipt of more than one loan at a time. Alternatively, PPARC can also give an advance of up to 75% of the total claim. This is very easy to arrange and allows for more flexibility.

Upon return you should submit your claim form to PPARC at soon as possible. Expenditure in certain categories **must be supported by receipts**. If you are not sure what to keep receipts for, just get receipts for everything whilst you are away and then worry about which ones to send off when you get back.

Similarly, costs of staying at Hale Pohaku Lodge (Mauna Kea) and the ORM Residencia (La Palma) will be settled directly by PPARC. When staying, have your letter of approval from PPARC with you so they know to bill PPARC and not you. Again, do not claim the cost on your claim form, but do detail the dates you stayed. It is important that you actually book yourself into these places well in advance just as you would a hotel, as they can fill up if you are not careful. Also, they can arrange accommodation at sea-level for you in local hotels at reduced prices, so let them know your whole itinerary by emailing them.

Many students combine foreign trips with a holiday in an exotic location. While you are there on "PPARC business", you are covered by PPARC's travel insurance scheme as detailed in the notes that accompany your approval letter. However, if you extend your trip to include a holiday it is prudent to assume that you will not be covered by PPARC's insurers. Students may wish to take out personal travel insurance for the holiday portion of the trip.

For travel funded by the Institute, the above procedure for obtaining approval applies except that the time-scales are more relaxed. However, you must still allow at least 10 working days for a loan if you require one. Additionally, if registration fees are to be paid direct by the University, allow plenty of time for them to do this. You must also fill in a form estimating all your expenses before you go and then you can claim the money back when you return.

5.4 Useful Web Addresses

Here is a list of web addresses that you might find useful in your first few weeks in Edinburgh. If what you need to know isn't in these, ask any of the other students.

• intra.roe.ac.uk/ — main ROE homepage
• intra.roe.ac.uk/atc/computing/ — computing at ROE
• intra.roe.ac.uk/atc/computing/docs/index.html — ROE computing documentation
• intra.roe.ac.uk/atc/computing/hardware/index.html — hardware at ROE
• intra.roe.ac.uk/atc/computing/software/index.html — software at ROE
• intra.roe.ac.uk/atc/computing/docs/lsun/lsun1.html — this page describes how to use 'findme' and 'showme' for obtaining html versions of Starlink documentation (extremely useful)
• http://helpdesk.roe.ac.uk/helpdesk/index.htm — The ROE Helpdesk Login page
• www.ph.ed.ac.uk/ — Physics and Astronomy Dept. homepage
• www.ed.ac.uk/ — main UoE homepage
• xxx.soton.ac.uk/ — Preprint archive
• adsabs.harvard.edu/abstract_service.html — ADS, scanned and electronic versions of most papers